CLAIMS

1. High yield ratio high-strength thin steel sheet superior in weldability and ductility, characterized by;

being comprised of steel containing, by mass%,

C: over 0.030 to less than 0.10%,

Si: 0.30 to 0.80%,

Mn: 1.7 to 3.2%,

P: 0.001 to 0.02%,

S: 0.0001 to 0.006%,

Al: 0.060% or less,

N: 0.0001 to 0.0070%,

containing further

Ti: 0.01 to 0.055%,

Nb: 0.012 to 0.055%,

Mo: 0.07 to 0.55%,

B: 0.0005 to 0.0040%, and

simultaneously statisfying

$1.1 \leq 14 \times Ti(\%) + 20 \times Nb(\%) + 3 \times Mo(\%) + 300 \times B(\%) \leq 3.7$,

the balance comprised of iron and unavoidable impurities, and

having a yield ratio of 0.64 to less than 0.92, a TSxEl of 3320 or more, an $YR \times TS \times El^{1/2}$ of 2320 or more, and a maximum tensile strength (TS) of 780 MPa or more.

2. High yield ratio high-strength thin steel sheet superior in weldability and ductility as set forth in claim 1, characterized by further containing, by mass%, one or two of

Cr: 0.01 to 1.5%

Ni: 0.01 to 2.0%,

Cu: 0.001 to 2.0%,

Co: 0.01 to 1%,

W: 0.01 to 0.3%.

3. High yield ratio high-strength hot-rolled steel sheet superior in weldability and ductility as set forth in claim 1 or 2, characterized in that said yield ratio is 0.68 to less than 0.92 and in that an X-ray intensity ratio of a {110} plane parallel to the sheet surface at

1/8 the thickness of the steel sheet is 1.0 or more.

4. High yield ratio high-strength cold-rolled steel sheet superior in weldability and ductility as set forth in claim 1 or 2, characterized in that said yield ratio is 0.64 to less than 0.90 and in that an X-ray intensity ratio of a {110} plane parallel to the sheet surface at 1/8 the thickness of the steel sheet is less than 1.0.

5. High yield ratio high-strength hot-dip galvanized steel sheet superior in weldability and ductility, characterized by comprising hot-rolled steel sheet comprised of the chemical components described in claim 3 and hot-dip galvanized.

6. High yield ratio high-strength hot-dip galvanized steel sheet superior in weldability and ductility, characterized by comprising hot-rolled steel sheet comprised of the chemical components described in claim 3, hot-dip galvanized, and alloyed.

7. High yield ratio high-strength hot-dip galvanized steel sheet superior in weldability and ductility, characterized by comprising cold-rolled steel sheet comprised of the chemical components described in claim 4 and hot-dip galvanized.

8. High yield ratio high-strength hot-dip galvanized steel sheet superior in weldability and ductility, characterized by comprising cold-rolled steel sheet comprised of the chemical components described in claim 4, hot-dip galvanized, and alloyed.

9. A method of production of high yield ratio high-strength hot-dip galvanized hot-rolled steel sheet superior in weldability and ductility, characterized by;

heating a cast slab comprised of the chemical components described in claim 3 to 1160°C or more directly or after once cooling,

hot-rolling it ending at the Ar_3 transformation temperature or more, then

cooling the sheet from the end of hot-

rolling to 650°C by an average cooling rate of 25 to 70°C/sec and

coiling it at 700°C or less in temperature.

10. A method of production of high yield ratio high-strength hot-dip galvannealed hot-rolled steel sheet superior in weldability and ductility, characterized by;

heating a cast slab comprised of the chemical components described in claim 5 to 1160°C or more directly or after once cooling,

hot-rolling it ending at the Ar_3 transformation temperature or more,

cooling the sheet from the end of hot-rolling to 650°C by an average cooling rate of 25 to 70°C/sec,

coiling it at 700°C or less in temperature, then

running it through a hot-dip galvanizing line during which making the maximum heating temperature 500°C to 950°C,

cooling it to (zinc-coating bath temperature-40)°C to (zinc-coating bath temperature+50)°C, then

dipping it in a zinc-coating bath and

giving it a skin-pass of a reduction rate of 0.1% or more.

11. A method of production of high yield ratio high-strength hot-dip galvannealed hot-rolled steel sheet superior in weldability and ductility, characterized by;

heating a cast slab comprised of the chemical components described in claim 6 to 1160°C or more directly or after cooling once,

hot-rolling it ending at the Ar_3 transformation temperature or more,

cooling the sheet from the end of hot-rolling to 650°C by an average cooling rate of 25 to

70°C/sec,

coiling it at 700°C or less in temperature, then

running it through a hot-dip galvanizing line during which making the maximum heating temperature 500°C to 950°C,

cooling it to (zinc-coating bath temperature-40)°C to (zinc-coating bath temperature+50)°C, then

dipping it in a zinc-coating bath, then

alloying it at 480°C or more in temperature and

giving a skin-pass of a reduction rate of 0.1% or more.

12. A method of production of high yield ratio high-strength cold-rolled steel sheet superior in weldability and ductility, characterized by;

heating a cast slab comprised of the chemical components described in claim 4 to 1160°C or more directly or after once cooling,

hot-rolling it ending at Ar_3 transformation temperature or more,

cooling the sheet from the end of hot-rolling to 650°C by an average cooling rate of 25 to 70°C/sec,

coiling it at 750°C or less in temperature,

pickling it, then

cold-rolling it at a reduction rate of 30 to 80%,

running it through a continuous annealing line during which making the average heating rate until 700°C 10 to 30°C/sec and making the maximum heating temperature 750°C to 950°C,

cooling in the cooling process after heating by an average cooling rate in the range of 500 to

600°C of 5°C/sec or more, then

giving it a skin-pass of a reduction rate of 0.1% or more.

13. A method of production of high yield ratio high-strength hot-dip galvanized steel sheet superior in weldability and ductility, characterized by;

heating a cast slab comprised of the chemical components described in claim 7 to 1160°C or more directly or after cooling once,

hot-rolling it ending at the Ar_3 transformation temperature or more,

cooling the sheet from the end of hot-rolling to 650°C by an average cooling rate of 25 to 70°C/sec,

coiling it at 750°C or less in temperature,

pickling it, then

cold-rolling it by a reduction rate of 30 to 80%,

running it through a hot-dip galvanizing line during which making the average heating rate up to 700°C 10 to 30°C/sec and making the maximum heating temperature 750°C to 950°C,

cooling it in the cooling process after heating by an average cooling rate in the range of 500 to 600°C of 5°C/sec or more,

cooling it to (zinc-coating bath temperature-40)°C to (zinc-coating bath temperature+50)°C, dipping it in a zinc-coating bath, and

giving it a skin-pass of a reduction rate of 0.1% or more.

14. A method of production of high yield ratio high-strength hot-dip galvannealed steel sheet superior in weldability and ductility, characterized by;

heating a cast slab comprised of the chemical components described in claim 8 to 1160°C or more

directly or after cooling once,

hot-rolling it ending at the Ar_3 transformation temperature or more,

cooling the sheet from the end of hot-rolling to 650°C by a cooling rate of 25 to 70°C/sec,

coiling at 750°C in temperature,

pickling it, then

cold-rolling it by a reduction rate of 30 to 80%,

running it through a hot-dip galvanizing line during which making the average heating rate up to 700°C 10 to 30°C/sec and making the maximum heating temperature 750°C to 950°C,

cooling it in the cooling process after heating by an average cooling in the range of 500 to 600°C of 5°C/sec or more,

cooling it to (zinc-coating bath temperature-40)°C to (zinc-coating bath temperature+50)°C,

dipping it in a zinc-coating bath, then

alloying it at 480°C or more in temperature, and

giving a skin-pass of a reduction rate of 0.1% or more.